

PRODUCTIVE REDUPLICATION IN SOUTHERN VIETNAMESE

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Abstract

Vietnamese reduplication shows harmony in tone height between base and reduplicant. This paper presents statistical analysis of productive reduplication in southern Vietnamese, which, unlike northern Vietnamese, has only one C tone and phonation of creakiness is not phonemically present. Our main findings show that reduplicative forms with tone-register harmony are used significantly less often than forms without and that the syllabic structure correlates with tone-register harmony preference.

Keywords: Vietnamese, reduplication, tones, tone-register harmony

ISO 639-3 codes: vie

1. Tone-register harmony in Vietnamese reduplication

This paper presents the results of our investigation on productive reduplication in southern Vietnamese dialects.

In Vietnamese reduplication, in both productive and non-productive processes, tones pattern within their registers, i.e., high and low. In the literature this agreement between tone and register is described as “tone-register harmony”, “tone harmony” or “tone sandhi” (Brunelle 2015, Burton 1992, Hà Q. N. 1998, Hồ L. 1976, Ngô T. N. 1984, Nguyễn D. H. 1997, Nguyễn and Ingram 2007, Phạm A. H. 2001, 2003; Seitz 1986; Thompson 1965; Vũ S. X. 1998; Võ X. H. 1997; Vũ T. T. 1991). There has not been any study on the productivity of reduplication and with respect to the tone-register agreement. Moreover, reduplication processes are often described using a system with six tones in open syllables and syllables ending in a sonorant, such as northern dialects. Southern dialects have five tones and some tones are different in voice quality compared to northern dialects.¹ Given these differences, our present investigation focuses on how the reduplication forms with the tone-register harmony is used in southern Vietnamese compared to the forms without. The research was conducted using in-person interviews and questionnaires.

Table 1 Northern Vietnamese tones

<i>Contour</i>	<i>level</i>	<i>rise / fall</i>	<i>fall-rise</i>	<i>rise/ fall</i>
<i>High</i>	<i>A1 (ngang)</i>	<i>B1 (sắc)</i>	<i>C1 (hỏi)</i>	<i>D1</i>
<i>REGISTER</i>		<i>rise</i>	<i>fall-rise</i>	<i>(sắc), rise</i>
<i>Low</i>	<i>A2 (huyền)</i>	<i>B2 (nặng)</i>	<i>C2 (ngã)</i>	<i>D2</i>
<i>REGISTER</i>		<i>fall, glott.</i>	<i>fall-rise, glott.</i>	<i>(nặng), fall</i>

¹ The term “southern” used in this study refers to the region from Đà Nẵng city (south-central) to Cà Mau province, the most southern tip of Vietnam.

The typical tonal classes in northern Vietnamese is shown in Table 1: eight tones divided into two registers and four series. Tones in the high register are A1 (*ngang*), B1 (*sắc*), C1 (*hỏi*), and D1 (*sắc*). Tones in the low register are A2 (*huyền*), B2 (*nặng*), C2 (*ngã*) and D2 (*nặng*) (e.g., Alves 1995, Bauman et al. 2009, Brunelle and Jannedy 2013, Burton 1992, Gedney 1989, Ferlus 2004, Haudricourt 1954, Kirby 2010, Maspero 1912, Michaud 2004, Nguyễn and Edmondson 1998, Pham A. H. 2003, Thompson 1965). Stop-final syllables can only occur with the D tones.

In Vietnamese reduplication, some types are productive, but other types are not.² In general, a syllable can be fully or partially reduplicated. For the type of partial, non-productive reduplication often used for emphasis (i.e., intensive), the reduplicant copies the initial consonant, the initial consonant and tone, the rhyme including tone, or the whole syllable except tone. When only the initial consonant is copied, tones of the base and reduplicant must be in the same register. Examples of the intensive reduplication include *đen* [đen^{A1}] ‘black’ > *đen đui* [đen^{A1}] [duj^{C1}] ‘very black’, *nặng* [nặng^{B2}] ‘heavy’ > *nặng nề* [nặng^{B2}] [ne^{A2}] ‘very heavy’. The reduplicant’s rhyme is grammatically unpredictable.

In productive types of reduplication, the speaker can either fully or partially reduplicate a stative verb to express a reduction in degrees or qualities (i.e., attenuative).³ In full reduplication, the reduplicative morpheme copies the entire base including tone, e.g., *tối* ‘dark’ > *tối tối* ‘a little dark’, *hồng* ‘pink’ > *hồng hồng* ‘pinkish’.⁴ In partial reduplication, tone-harmony is also observed. Some examples are provided in (1). When the base has either A1 or A2 tone, as in (1a, b), the reduplicant looks like an exact copy of the base. Full and partial reduplication are not distinguishable in such forms. In (1c-h) the reduplicant copies the whole syllable except the tone. The reduplicant’s tone is predicted from the base tone. It is A1 if the base tone is in the high register group, as in (1c-e), and A2 if the base tone is in the low register group, as in (1f-h). For a base with tone D1 or D2 (1e, h), because the reduplicant can only carry A series tones, the final stop cannot be copied onto the reduplicant. The stop must turn to a homorganic nasal maintaining its place of articulation. Productive reduplicative forms as those in (1) are often not listed in a dictionary. Examples for tone-register harmony in non-productive partial reduplication are provided in (1).

(1)	Monosyllabic base	Full reduplication	Partial reduplication	Gloss
a.	<i>đen</i> [đen ^{A1}]	[đen ^{A1}] [đen ^{A1}]	[đen ^{A1}] [đen ^{A1}]	‘blackish’
b.	<i>vàng</i> [vaŋ ^{A2}]	[vaŋ ^{A2}] [vaŋ ^{A2}]	[vaŋ ^{A2}] [vaŋ ^{A2}]	‘yellowish’
c.	<i>trắng</i> [tǎŋ ^{B1}]	[tǎŋ ^{B1}] [tǎŋ ^{B1}]	[tǎŋ ^{A1}] [tǎŋ ^{B1}]	‘whitish’
d.	<i>nhỏ</i> [ɲɔ ^{C1}]	[ɲɔ ^{C1}] [ɲɔ ^{C1}]	[ɲɔ ^{A1}] [ɲɔ ^{C1}]	‘a little small’
e.	<i>sắc</i> [ʃǎk ^{D1}]	[ʃǎk ^{D1}] [ʃǎk ^{D1}]	[ʃǎŋ ^{A1}] [ʃǎk ^{D1}]	‘a little sharp’
f.	<i>nặng</i> [nặng ^{B2}]	[nặng ^{B2}] [nặng ^{B2}]	[nặng ^{A2}] [nặng ^{B2}]	‘a little heavy’
g.	<i>cũ</i> [ku ^{C2}]	[ku ^{C2}] [ku ^{C2}]	[ku ^{A2}] [ku ^{C2}]	‘a little old’
h.	<i>ngọt</i> [ŋɔt ^{D2}]	[ŋɔt ^{D2}] [ŋɔt ^{D2}]	[ŋɔn ^{A2}] [ŋɔt ^{D2}]	‘a little sweet’

There are many exceptions to the tone-register harmony rule, mostly with non-productive reduplicative forms.

In southern dialects, there are only five tones in non-stop final syllables.⁵ The figure below from Bauman et al. (2009) shows the normalized pitch trajectories of tones in open syllables from a southern speaker, with labels in letters for B and C tones added. Two level tones are A1 (*ngang*), a high tone, and A2 (*huyền*), a low tone. B1 (*sắc*) is a high, rising tone, B2 (*nặng*) is a low, falling-rising tone. Unlike the

² In this paper, the meaning of “productivity” is not about the quantity because the number of lexicalized reduplicative items is numerous in dictionaries. Rather “productive” refers to word formation which is described in the section.

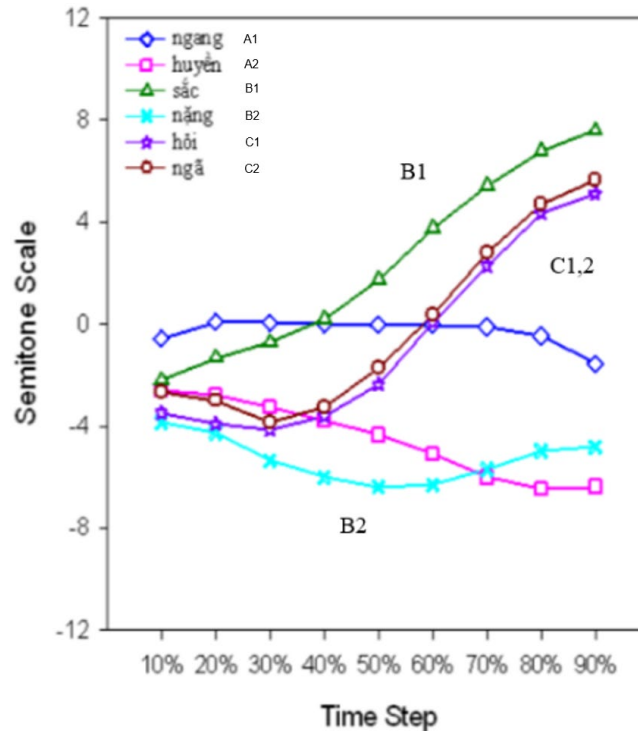
³ In some cases, there might be some slight differences in nuances between productive full and partial reduplication. The differences, however, are seen when comparing styles, i.e., spoken vs written language. Part I in the questionnaires attempted to provide contexts in a ‘conversational style’ or closest to. Style, as another independent variable, is included in our follow-up study when comparing the use of productive reduplication across dialects.

⁴ We exclude problematic forms that resemble full reduplication, however, are non-productive, e.g., *chuồn chuồn* ‘dragon flies’, *ba ba* ‘a type of turtles’, or *chăm chăm* ‘persistent, extremely focused’.

⁵ Our data also include participants from the south-central region (Đà Nẵng city, Quảng Nam, and Quảng Ngãi). In these dialects, the B2 tone has a creaky voice/glottal stop, like northern dialect B2 (Pham A. H. 2019). Crucially, C1 and C2 also merge in these dialects and the resulting tone is falling-rising, similar to southern C (1,2) as shown in Figure 1. For the purpose of this paper, tonal variations in dialects of the south-central region do not affect the findings.

northern B2, southern B2 tone does not have glottal stop (e.g., Brunelle 2009a, 2009b; Bauman et al. 2009; Gsell 1980; Hoàng C. C. 1989; Thompson 1965; and Vũ T. P. 1981, 1982). Most importantly, in southern dialects, C1 and C2 merged, shown with two lines overlapped in Figure 1. The resulting tone has a similar contour (falling-rising) and f_0 as the northern C2 (*ngã*)⁶. D1 and D2, not shown in Figure 1, have shorter but similar pitch contours as their counterparts, B1 and B2, respectively. D1 (*sắc*), is a high rising tone; D2 (*nặng*) is a low, falling tone.

Figure 1 Southern Vietnamese tone system (Bauman et al. 2009)



In writing, each of six northern tones is marked with its own diacritic to clearly indicate the different meanings. Speakers of all dialects must spell correctly when writing regardless if the contrast is maintained in their dialect. Based on the spelling and meaning, Southern speakers recognize C1 and C2 as two distinct tones, e.g., *mỡ* [mɤ^{C2}] ‘fat’ vs *mở* [mɤ^{C1}] ‘to open’. When writing, Southern speakers need to use the correct tonal diacritic for C1 and C2.

In this study we explore how productive reduplication is used in southern speech with respect to tone-register harmony. In other words, although both full and partial reduplication types signal a reduction in quality or degrees, we seek to invest which productive type southern speakers prefer. More specifically, because the tonal merger with C tones in partial reduplication can result in confusion, we further hypothesize that the direction of preference should favor full reduplication over partial reduplication in southern speech. Additionally, because the reduplicative processes are more complex for syllables with a D tone due to the tone-coda restriction, we wanted to see if there were any significant difference in usage preference of partial reduplication for the B and C tones compared with that of the D tones. The hypotheses we tested were:

- Hypothesis 1: speakers should prefer full or partial reduplication over no preference.
- Hypothesis 2: there should be a difference between the B and the C tonal pairs in the reduplication process.
- Hypothesis 3: there should be a difference between the B and C tonal pairs and the D pair.

⁶ The tonal trajectories and the f_0 values in any of the dialects can greatly vary from speakers to speakers and may be within the same speaker. These variations and the presence of creakiness in B2 in some dialects of south-central Vietnam do not affect the tone’s grouping of registers.

2. Methodology and procedures

The data were collected from spontaneous responses of participants in the survey which was conducted in the following provinces and cities: Mỹ Tho, Cần Thơ, Hồ Chí Minh city, Nha Trang city, and Đà Nẵng city. The data included 36 Southerners, 17 males and 19 females, from 20 to 57 years old. At least three generations of the participants' families (grandparents, parents and selves) were born and raised in the following cities and provinces in southern Vietnam: Cà Mau, Mỹ Tho, Cần Thơ, Hồ Chí Minh city, Phú Yên, Khánh Hoà, Quảng Ngãi, Bình Định, Quảng Nam, and Đà Nẵng city.⁷ The levels of education of the participants included elementary school (2), high school (8), bachelor's degree (23), and post graduate degree (3) with a bachelor's degree as the model response. Nine people hold labour jobs such as drivers, cook, cleaning workers, or auto mechanics. Twenty-seven people hold non-labour jobs such as accountants, teachers, college students, book editors, or university secretary.

Participants filled out a questionnaire (see Appendix) consisting of sets of questions designed to elicit reduplicatives in casual speech. The questions included a set of targets of 35 monosyllabic words with 8 tones and in all syllable types. Out of 35 words, 6 have the A tones (fillers), 9 have the B tones (*ngứa* [ɲiə^{B1}] 'itchy', *đắng* [dǎŋ^{B1}] 'bitter', *trắng* [tǎŋ^{B1}] 'white', *tím* [tim^{B1}] 'purple', *đói* [dɔj^{B1}] 'be hungry', *mặn* [mǎn^{B2}] 'salty', *lạnh* [lɛŋ^{B2}] 'cold', *nặng* [nǎŋ^{B2}] 'heavy', *rộng* [roŋm^{B2}] 'spacious'), 10 have the C tones (*thẳng* [thǎŋ^{C1}] 'straight', *mỏi* [mɔj^{C1}] 'ached', *đỏ* [dɔ^{C1}] 'red', *nhỏ* [ɲɔ^{C1}] 'small', *hở* [hɔ^{C1}] 'open', *cũ* [ku^{C2}] 'old', *rõ* [rɔ^{C2}] 'clear', *nhão* [ɲaw^{C2}] 'watery', *mỡ* [mɔ^{C2}] 'fatty', *loãng* [lwan^{C2}] 'thin (liquid)'), and 10 have the D tones (*ghét* [ɣet^{D1}] 'to dislike', *mắc* [mǎk^{D1}] (south) 'expensive', *múp* [mup^{D1}] 'chubby' (south), *mát* [mat^{D1}] 'cool', *thích* [thik^{D1}] 'to like', *ngọt* [ɲot^{D2}] 'sweet', *mệt* [met^{D2}] 'tired', *mập* [mɔp^{D2}] 'be fat' (south), *đẹp* [dɛp^{D2}] 'beautiful', *chật* [cɛt^{D2}] 'tight'. The bases with A tones were included to determine if participants provided unexpected forms, i.e., partial reduplication.

The questionnaire had two parts. In part I, the context was given for each of 24 monosyllabic bases (3 words for each tone x 8 tones). The participant was asked to fill in the blank with a reduplicant they would use conversationally for the meaning 'somewhat, a little bit'. The frame sentence is: *X thấy base* (X seems base). X can be a phrase or a word. For example: *lạnh* "cold": *Bữa nay thấy trời lạnh* "Today it seems a bit cold". When a participant provided a form from different types of reduplication, or skipped one or more questions, the answers for the whole set of questions were removed from the analysis. These cases rarely happened.

Part II provided both partial and full reduplicative forms for each of 12 monosyllabic bases in isolation (two words for each tone, excluding A tones). Participants were asked to circle the form they would normally use. For each given word, participants have two options: they can either select a full reduplicative form or a partial reduplicative form. For C2 bases, the literature shows either A1 or A2 can be selected as the reduplicant' tone (more in Section 4); therefore, we provided three options for the bases with C1 and C2 tones: participants can choose either A1 or A2 if partial reduplication was selected, otherwise they can choose full reduplication. The first author, who interacted with the participants, speaks with a northern dialect which contrasts C1 and C2. Although Part II did not have the option, "all or nothing", i.e., neither partial nor full reduplication, Part I provided an open-ended space for participants to fill in. Some participants claimed that they do not "talk like that", i.e., they do not use productive reduplication. There are words/phrases in southern dialects to express the attenuative meaning, such as *hơi*, *một chút*, *một chút xíu*, or *chút xíu* 'a little bit, somewhat', e.g., *hơi nóng* 'a bit hot', *lạnh chút xíu* 'a little cold'. We did not further persuade those speakers to participate in the test. A very small number of participants only showed their preference for a few forms on the questionnaires and left the rest blank. These participants were excluded from the analyses.

3. Data and findings

According to Hypothesis 1, speakers should prefer full or partial reduplication over no preference. We conducted a series of 2-tailed one-sample t-tests comparing the means of each pair (see Table 2) against the midpoint of .5 where responses were scaled to probability values between 0 and 1 such that values closer to 1 would indicate an increasing preference for full reduplication and values closer to 0 would indicate an increasing preference for partial reduplication. Results show that participants used full reduplication

⁷ The dialects of participants: Mỹ Tho (3), Cần Thơ and Cà Mau (3), Nha Trang (9), Quảng Nam and Đà Nẵng (17), Bình Định and Quảng Ngãi (4).

significantly more often than partial reduplication in all three tone pairs: B, C, and D. All effects were statistically significant at $\alpha=.05$ (56 out of 179 tokens of B1 and 53 out of 131 tokens of B2 were partial reduplication; 41 out of 177 tokens of C1 and 14 out of 176 tokens of C2 were partial reduplication; 14 out of 176 tokens of D1 and 20 out of 178 tokens of D2 were partial reduplication). Furthermore, we can see in Table 2 that the means for each pair (.700, .834, and .880) are larger than the midpoint value of .5, indicating that participants favored full over partial reduplication. This effect was strongest for the D tones, with an effect size of $d=1.87$, followed by the C tones with an effect size of $d=1.36$, then the B tones with an effect size of $d=.619$.

Table 2 Descriptives and One-Sample T-test statistics for Reduplication Pairs

Variable	N	M	SD	t	p	d
B1(<i>sắc</i>) and B2(<i>nhặng</i>)	33	.700	.323	3.56	.001	.619
C1(<i>hỏi</i>) and C2(<i>ngã</i>)	31	.834	.246	7.67	<.001	1.36
D1(<i>sắc</i>) and D2(<i>nhặng</i>)	35	.880	.203	11.1	<.001	1.87

Note: N refers to the number of valid entries, or participants, in this analysis.

According to Hypothesis 2, there should be a difference between the B and the C tonal pairs in the reduplication process. Because participants provided scores for all 3 tonal pairs, a paired-samples t-test was conducted to examine the difference between these 2 pairs; results show that C tones ($M=.839$, $SD=.246$) have a significantly higher mean reduplication score than B tones ($M=.706$, $SD=.318$), $t(30)=-2.436$, $p=.021$, $d=.438$, showing that C tones are fully reduplicated more often than B tones.

According to Hypothesis 3, there should be a difference between the B and C tonal pairs and the D pair. In order to test this hypothesis, percentage scores for the B and C pairs were combined into a mean index, which is then compared against percentage scores for the D pair. Because participants provided scores for all 3 tonal pairs, a paired-samples t-test was conducted to determine if there existed a difference between the index of groups B and C tones and group D tones. Results show that the D tones ($M=.890$) had significantly higher full reduplication scores than B and C pairs combined ($M=.772$), $t(30)=2.76$, $p=.01$, $d=.496$, meaning speakers fully reduplicated more often on D tones than on B and C tones combined.

Table 3 Descriptives and Paired-Samples T-test Statistics for Tonal Pair Comparisons

Variable	N	M	SD	t	p	d
B and C tones combined	31	.772	.240			
D tones	31	.890	.206			
(B and C) vs. D tones				2.76	.01	.496

Note: The first two lines provide descriptive values for each of the variables used in the analysis. The last line provides the test statistics for the paired-samples t-test.

Overall, our results show that, for all three tonal pairs, a) speakers are significantly more likely to use full reduplication (no tone-register harmony) over partial reduplication (with tone-register harmony); b) that between the B and C tones, speakers fully reduplicated significantly more with the C tones than they did with the B tones; and c) that speakers fully reduplicated significantly more with the D tones than they did with the B and C tones. The effect sizes associated with these differences ranged from medium to large.

Reduplication with the C and D tone bases

Recall that Northern Vietnamese C1 and C2 tones are merged in Southern dialects. A point worth noting is that, in the literature, for partial reduplication, a reduplicant of a C tone base can take either of the A tones, e.g., *sẽ* ‘gentle’ [se^{C2}] => *se sẽ* [$se^{A1} se^{C2}$] or *sẻ sẽ* [$se^{A2} se^{C2}$] (Hoàng et al. 2011:338, Nguyễn V. T. 1986:1558). However, very few cases of reduplication with a C2 base were provided in the literature. The only example with the C2 base in Lê V. L. ([1948] 1968:38) is *dê dê* [$ze^{A1} ze^{C2}$] ‘a bit easy’. *Sẽ* ‘gentle’ is the only C2 base listed in the two dictionaries, Hoàng et al. (2011) and Nguyễn V. T. (1986). Thompson (1965:172) cites two bases with the C2 tone, both take only A1 as their reduplicant tone: *rõ* ‘clear’ [ro^{C2}] => *ro rõ* ‘a bit clear’ [$ro^{A1} ro^{C2}$], and *sẽ* ‘gentle’ [se^{C2}] => *se sẽ* [$se^{A1} se^{C2}$] ‘a bit gentle’. C2 is a low register tone and A1 is a high register tone, thus the reduplicant’s tone is not what tone-register harmony would predict.

In our study with southern speakers, because C2 tone bases can take either of the A tones, we thought there should be a difference between the A1 and A2 tones when the base is the C2 tone. We separated 11 participants who produced partial reduplication for the C bases for this dataset (the remaining participants provided only full reduplication for the C bases). A one-sample t-test was conducted to test the A1 percentage against a likelihood of 50/50. The test showed that when the base is the C2 and an A tone was chosen for the reduplicant, A1 was more likely to be chosen than A2 ($M=.788$, $SD=.40$, $t(10)=2.375$, $p=.039$, $d=.720$). In all 176 tokens with C2 bases, only 18 tokens from 11 subjects were partially reduplicated. As shown in (4) below, 5 partial reduplicative tokens are for the word *loãng* ‘thin’. Among 18 partial reduplicative forms, participants chose A1 83% of the time and A2 17% of the time. A chi-square exact goodness of fit test confirmed that this distribution was significantly different from a 50-50 likelihood, $\chi^2(1)=8$, $p=.005$.

In summary, for the bases with C1, when participants provided partial reduplication, the reduplicant’s tone was always A1, as expected by the tone-register harmony rule. When the base has C2, a low register tone, we would expect to find A2, another low register tone, as the reduplicant’s tone. However, the result was striking: out of 18 tokens, the expected A2 tone was seen only in 3 tokens, and the unexpected A1 tone was selected in 15 tokens.

It is understandable that because C1 and C2 are one tone in southern phonology, southern speakers treat C1 and C2 as if they were one tone regardless of the knowledge that C1 and C2 are distinct in their literary forms. However, it is interesting that the southern C2 tone is a phonetically high tone (Bauman et al. 2009 Figure) and is also treated phonologically as if it were a high register tone (different from the grouping in Table 1).

Our study also shows there are more partial reduplicatives for C1 bases (23%) than those for C2 bases (10%), as in Table 4 and Table 5, respectively. Among partial reduplicatives with C1 bases in Table 4, the number of tokens varies widely between bases. The two words with the highest number of partial reduplicatives, i.e., *nhỏ* [nɔ^{C1}] ‘small’ and *đỏ* [dɔ^{C1}] ‘red’, are the most cited examples for tone-register harmony in the literature for productive reduplication (e.g., *đỏ* ‘reddish’ is the only example for C1 in Ngô T. N 1984, Brunelle 2015).

Table 4 Partial reduplicatives for C1 bases with A1 in the reduplicants

# tokens	<i>nhỏ</i> [nɔ ^{C1}]	<i>đỏ</i> [dɔ ^{C1}]	<i>hở</i> [hɔ ^{C1}]	<i>mỏi</i> [mɔɯ ^{C1}]	<i>thẳng</i> [tʰǎŋ ^{C1}]	Total
C1 bases	‘small’	‘red’	‘open’	‘ached’	‘straight’	
177	13	11	7	6	4	41 (23%)

For C2 bases the perfect examples for tone-register harmony provided in the literature are lexicalized items and mostly extracted from dictionaries (e.g., Hà Q. N. 1998, Ngô T. N. 1984, Võ X. H. 1997). Examples with C2 bases in the productive type are much rarer in the literature. In our data, only 10% of C2 bases are partially reduplicated (Table 5). Among partial reduplicatives with C2 bases, three tokens with the (expected) A2 are seen only in two words, *rõ* [rɔ^{C2}] (1 out of 3 tokens), and *loãng* [lɔwɔŋ^{C2}] (2 out of 6 tokens). The rest take A1 as their reduplicant tone.

Table 5 Partial reduplicatives for C2 bases with either A1 or A2 in the reduplicants

# tokens	<i>loãng</i> [lɔwɔŋ ^{C2}]	<i>nhão</i> [naw ^{C2}]	<i>mỡ</i> [mɔ ^{C2}]	<i>cũ</i> [ku ^{C2}]	<i>rõ</i> [rɔ ^{C2}]	Total
C2 bases	‘thin (water)’	‘watery’	‘fatty’	‘old’	‘clear’	
176	6	4	3	2	3	18 (10%)

Although research evidence reveals that typically less than 5% of the variance in social behavior is accounted for by gender (Aries 1996:7), a closer look at the tokens of partial reduplication in Table 6 showed something striking: most partial reduplicative forms with the C tones were provided by females. Among 353 tokens, 55 tokens were partial reduplicative forms. Out of 55 tokens, 38 tokens (69%) were from 11 (out of 19) females, and 17 tokens (31%) were from 7 (out of 17) males.

Table 6 Number of partial reduplicative forms between males and females for C tones

	# tokens	%		# tokens of partial	%
Partial reduplication	55	16%	Female	38	69%
Full reduplication	298	84%	Male	17	31%
Total	353	100%		55	100%

As for the D tones, recall that partial reduplication involves structure changing to satisfy the tone-coda restriction. Depending on the base tone, the reduplicant then takes one of the A tones, e.g., A2 for the D2 base in *ngọt* [ŋot^{D2}] => [ŋon^{A2}] [ŋot^{D2}]. The result in Table 3 above showed that partial reduplication involving D bases is significantly more likely to be avoided than when the base has B and C tones combined. Of a total 354 tokens with the D tones, only 9.5% (34 tokens) were partial reduplications. The rest were fully reduplicated. The distribution of 34 partial reduplicative words for ten D bases is shown in Table 7. All three bases with the lowest partial reduplicative forms (h-j) are southern lexical items. The northern equivalents of southern *mập* ‘fat, heavy’ and *mắc* ‘expensive’ are *béo* and *đắt*, respectively. Southern *múp* ‘chubby, plumb’ is equivalent to northern *mum múp*, or *múp múp* (Nguyễn V. T. 1986:111), which are lexicalized reduplicative forms. Like for the C tones, it seems females are more likely to select partial reduplication than males: among 34 tokens of partial reduplication with D tones, only 5 tokens were provided by four males. The rest were produced by 11 females.

Table 7 The distribution of partial reduplicative forms for D tones

	Base	34 out of 354 tokens of partial reduplicative	Gloss
a.	<i>ngọt</i> [ŋot ^{D2}]	8	‘sweet’
b.	<i>mát</i> [mat ^{D1}]	6	‘cool’
c.	<i>đẹp</i> [dep ^{D2}]	5	‘beautiful’
d.	<i>chật</i> [cɛt ^{D2}]	5	‘tight’
e.	<i>thích</i> [tʰik ^{D1}]	4	‘to like’
f.	<i>ghét</i> [ɣet ^{D1}]	3	‘to hate’
g.	<i>mệt</i> [met ^{D2}]	1	‘be tired’
h.	<i>mập</i> [mɔp ^{D2}] (SVN)	1	‘fat, heavy’
i.	<i>mắc</i> [mɔk ^{D1}] (SVN)	1	‘expensive’
j.	<i>múp</i> [mup ^{D1}] (SVN)	0	‘chubby, plumb’

In summary, among tonal pairs in southern dialects, the D tones has the highest score of full reduplication, followed by the C tones. Partial reduplication, which involves tone-harmony, is seen mostly with the B tones in productive reduplication.

4. Conclusions and implications

This investigation is the first to statistically examine productive reduplication in Vietnamese and through interviews using questionnaires. Our data show that in southern speech, reduplicative forms with tone harmony are significantly more likely to be avoided. For the one C tone in southern dialects, where partial reduplication was observed, among the available A1 and A2 tones, C tone bases take A1 tone as its reduplicant tone. Finally, partial reduplication is most significantly avoided in syllables ending in a stop consonant (which involves two steps in harmonizing register and tone).

Because no single study can provide the full picture of any effect, additional studies in this line of research would allow us to not only explore boundary conditions of the discussed effects but also provide greater confidence in the existence of the effects via (conceptual) replications and meta-analytic data points. As such, planned future work includes a replication of the study in northern Vietnamese, and examining other variables, such as “region” and “style”, to evaluate overall productive reduplication in Vietnamese.

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Appendix

Name	Age	Occupation	Education
Birthplace		Residence (for how long)	

I. Fill in the blank with the words you often use with the meaning ‘a little bit, rather’.

Model sentences:

xanh ‘blue’: *Cái gì coi/hình như/ nhìn thấy*..... ‘Something seems(blueish)’
lạ ‘different’: *Hôm nay nó hình như*..... ‘He seems a bit (different) today’
chậm ‘slow’: *Nó đi*..... ‘He walks.... (rather slow)’.

1. *đen* ‘black’:

Bữa nay sao thấy nó..... ‘He seems a bit tanned today’

2. *mặn* ‘salty’:

Bỏ muối vô giờ nếm thấy ‘It now tastes a bit salty after adding some salt’

3. *ngứa* ‘itchy’:

Ăn cá vô giờ thấy..... ‘It feels a bit itchy after eating that fish dish’

4. *lạnh* ‘cold’:

Bữa nay ra ngoài thấy.....*rồi*. ‘It is a bit cold outside these days’

5. *buồn* ‘sad’:

Nhìn nó sao thấy nó có vẻ ‘He/she looks a bit sad’

6. *mỏng* ‘thin’:

Thịt xắt*một chút*. ‘Slide the meat a bit thin, please’

7. *cong* ‘curved’:

Vạch này hình như..... ‘This line seems a bit curved’

8. *nặng* ‘heavy’:

Túi có gì trong đó mà xách lên thấy..... ‘Something in this bag. It is a bit heavy when lifted’

9. *mỏi* ‘ached’

Hôm nay trở trời, thấy người..... ‘The weather has changed today, my body feels a bit ached’

10. *đắng* ‘bitter’

Trái này ‘This fruit is rather bitter’

11. *hồng* ‘pink’

Màu này ‘This color is pinkish’

12. *ngọt* ‘sweet’

Trái này ăn thấy cũng ‘This fruit tastes a little sweet’

13. *vàng* ‘yellow’

Cái gì*đó?* ‘What is that yellowish thing?’

14. *mệt* ‘tired’

Làm mới một chút đã thấy có vẻ..... ‘After working for a bit, it already feels rather tired’

15. *điếc* ‘deaf’

Nói lớn vậy không nghe, hình như nó..... ‘That was loud but he did not hear. He seems rather deaf’.

16. *mập* ‘heavy, fat’

Cổ đẹp nhưng thấy có vẻ..... ‘She is beautiful, but seems a bit heavy’

17. *khét* ‘burned (smell)’

Mùi gì.....*vậy?* ‘What is the smell that seems a bit burned?’

18. cũ ‘old’

Cái bàn ủi này mới mua về mà sao thấy..... ‘This is a brand-new iron, but it looks rather old’

19. hay ‘interesting’

Phim đó cũng..... ‘That movie is rather interesting’

20. mập ‘chubby’

Lâu ngày không gặp, thấy cô bữa nay..... ‘Not seeing her for a while, she seems a bit chubby now’

21. đỏ ‘red’

Mắt chị bữa nay thấy..... Có đau mắt không? ‘Your eyes seem a bit red. Are they ok?’

22. dễ ‘easy’

Bài thi vừa rồi thấy cũng..... ‘The last exam seems a bit easy’

23. trắng ‘white’

Cái gì đó? ‘What is that whitish thing?’

24. nhão ‘watery’

Cơm bữa nay thấy..... ‘Rice today seems a bit watery’

II. Khoanh tròn 1 chữ bạn thường nói nhất. Gạch dưới chọn lựa thứ 2.

- | | | | |
|------------------------|-------------|-------------|-------------|
| 1. tím ‘purple’ | tím tím | tim tím | |
| 2. mỡ ‘greasy’ | mơ mỡ | mờ mỡ | mỡ mỡ |
| 3. mát ‘cool’ | mát mát | man mát | |
| 4. đói ‘hungry’ | đoi đói | đói đói | |
| 5. rộng ‘spacious’ | rông rộng | rộng rộng | |
| 6. nhỏ ‘small’ | nhỏ nhỏ | nho nhỏ | nhò nhỏ |
| 7. đẹp ‘beautiful’ | đẹp đẹp | đềm đẹp | |
| 8. loãng ‘thin’ | loang loãng | loãng loãng | loàng loãng |
| 9. chặt ‘tight’ | chăn chặt | chật chặt | |
| 10. nhẹ ‘light’ | nhẹ nhẹ | nhè nhẹ | |
| 11. hở ‘exposed’ | hơ hở | hờ hở | hở hở |
| 12. thích ‘be fond of’ | thình thích | thích thích | |